DOCUMENT RESUME

ED 293 853 TM 011 404

AUTHOR Randhawa, Bikkar S.
TITLE Structural Relations of Conditions of Learning and Achievement.
SPONS AGENCY Saskatchewan Dept. of Education, Regina.; Saskatchewan School Trustees Association, Regina.
PUB DATE Apr 88
NOTE 26p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 5-9, 1988).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; Achievement Tests; Analysis of Covariance; *Basic Skills; *Educational Environment; Elementary Education; *Environmental Influences; Grade 7; *Learning Experience; Rural Urban Differences; Statistical Analysis
IDENTIFIERS Canadian Tests of Basic Skills; Learning Environment Inventory

ABSTRACT

The relationships between learning conditions and achievement were studied in a sample of 15 urban and 14 rural grade 7 classrooms. Students were administered the Canadian Tests of Basic Skills (CTBS) in Vocabulary, Reading, Language, and Mathematics, as well as the Learning Environment Inventory (LEI) and a questionnaire about school, family, and community characteristics. Data from each class were aggregated by sex. A canonical correlation analysis resulted in one significant canonical correlation; the first canonical dimension of the LEI battery explained, in terms of redundancy coefficient, 33.4% of the variance of the CTBS battery. Only 6.6% of the variance in the LEI battery was explained by the CTBS battery. The multi-variate analysis of covariance, LEI as covariates, produced significant effects for sex and locale. Interesting structural relations were also suggested by the influence of other classroom variables on achievement. Data are summarized in four tables. (SLD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED293853

STRUCTURAL RELATIONS OF CONDITIONS OF LEARNING AND ACHIEVEMENT

Bikkar S. Randhawa

University of Saskatchewan

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

BIKKAR S. RANDHAWA

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Running Head: LEARNING ENVIRONMENT

A paper presented at the AERA Annual Meeting, New Orleans, April 4-8, 1988. Funding of this research was provided by the Saskatchewan School Trustees' Association and the Department of Education. However, the endorsement of this document by the funding agencies is neither intended nor implied.

Send all correspondence in connection with this manuscript to Dr. B. S. Randhawa, Department of Educational Psychology, College of Education, University of Saskatchewan, Saskatoon, Canada S7N 0W0.

TM 011 404

Abstract

A sample of 29 grade 7 classrooms in a mid-Western province, 15 urban and 14 rural, participated in the study. Students in each class were administered the Canadian Tests of Basic Skills (Form 5) in Vocabulary, Reading, Language, Mathematics over a two day period and shortly after were administered the Learning Environment Inventory (LEI). The LEI consists of 105 items comprising 15 scales. The students also completed a questionnaire which elicited information on school-related activities and behaviours as well as on family and community characteristics. The teachers of each class completed for each student an 18 item behaviour rating scale which provided scores on relating, investing, coping, and asserting variables. Teachers also completed a questionnaire which provided information on their perception of classroom characteristics such as cooperation, attentiveness, study skills, homework completion, and overall class management.

Data from each classroom were aggregated by sex. The within-correlation matrix from the Locale x Sex design for the 15 LEI variables and nine CTBS tests and subtests was analyzed employing the canonical correlation procedure. Only one significant ($p = .05$) canonical correlation ($R_c = .83$) was obtained; however, the first canonical dimension of the LEI battery explained ,in terms of redundancy coefficient, 33.4% of the variance of the CTBS battery. On the other hand, only 6.6% of the variance in the LEI battery was explained by the CTBS

battery. The multivariate analysis of covariance, LEI as covariates, produced significant effects for Sex and Locale. The influence of other classroom variables on achievement, employing canonical correlation and structural analysis, was also examined. It suggests interesting structural relations and implies that school/class effectiveness literature and theory ought to pay proper attention to the relevant complex of variables and should suggest how effectiveness is manifested.

STRUCTURAL RELATIONS OF CONDITIONS OF LEARNING AND ACHIEVEMENT

A variety of cognitive measures are used by practitioners and specialists to guide educational practice and to make a variety of instructional and administrative decisions. Cognitive measures of intellectual abilities, knowledge of subject matter, and a number of information processing skills and processes have had a long history of use in educational practice. Because of the fact that cognitive measures are predictive of current and future academic achievement and also that they provide initial diagnostic information for instructional planning and remediation, their use is quite common. These measures could be regarded as aptitudes in the technical sense of current characteristics that predict the capacity to learn (English & English, 1958). Similarly, a number of noncognitive measures, such as motivation, interest, and affect, may also qualify as aptitudes in the technical sense, for they too are predictive of likelihood of success in a given learning environment (Bloom, 1976; Cronbach & Snow, 1977). The noncognitive individual "characteristics share a number of educationally relevant features with cognitive traits beyond sheer predictiveness" (Messick, 1979, p. 281). These common features , according to Messick (1979), are characterized by the following functions of the two variable types:

> For example, they may both serve as mediating or instrumental variables, either facilitative or disruptive,

> influencing level and rate of subject-matter learning; or as moderator or interactive variables determining differential responses, either qualitative or quantitative, to different aspects of instructional method or context; or as outcome variables reflective of educational goals in their own right or of valued personal characteristics that should not be undermined by unintended educational side effects. (p. 281)

Often a distinction is made between cognitive and noncognitive measures. However, when a noncognitive label is used to refer to such personality variables as cognitive style or orientation, motives, and values, it leads to confusion and ambiguity. This is because many personality dimensions and "traits usually involve important cognitive components... and some of the putative noncognitive variables themselves appear to be at least as much cognitive in nature as not" (Messick, 1979, p. 282).

Furthermore, Messick (1979) has identified seven educational functions being served by noncognitive measures, akin to those served by cognitive measures. These are: access, objectives and standards, guidance, selection, placement, instruction and learning, and evaluation and "thus deal, respectively, with the who, what/which, why, whether/where, when/how long, how, and how well of education" (p. 289). Noncognitive variables are characterized to be variously relevant for the seven functions and the pattern of relevance is seen to be different depending on the type of the educational institution or level. All twelve

noncognitive variables identified as appropriate for educational service, namely, experiential background, affects, attitudes/beliefs, interests, motivation, curiosity, temperament, social sensitivity, coping strategies, cognitive styles, creativity, and values, are pervasively useful for instruction and learning and evaluation at all educational levels. However, for other functions, these noncognitive variables are differentially relevant depending on the educational level.

Given this background to the pervasive importance of noncognitive variables for learning and evaluation, the present paper examines the nature of learning environment variables. Specifically, this paper examines the structure of the Learning Environment Inventory (LEI) (Anderson, 1971; Fraser, Anderson, & Walberg, 1982), when used as a generalized measure, in the context of achievement measures and other noncognitive measures.

In a large number of previous studies, the Learning Environment Inventory (LEI) was used in connection with a single subject matter, i.e., students responded to the LEI in order to convey their perceptions of the learning climate in one particular school subject, mathematics, English, science, or social studies, and students' achievement, understanding, and attitudes were also measured (see Fraser, 1986; Haertel, Walberg, & Haertel, 1981). A general conclusion offered by the quantitative research synthesis by Haertel et al. (1981) and the review of literature by Fraser (1986) is that LEI predicts a statistically significant proportion of variance in outcome

measures. Also, in canonical analyses, different scales of the LEI represented the discriminant dimension that was correlated with a discriminant dimension of the outcome measures. For example, Walberg (1969) reported that a canonical variate with a high positive loading on the difficulty scale was predictive of the canonical variate represented by the cognitive posttests. In an earlier study, Anderson and Walberg (1968) found one significant canonical correlation relating a canonical variate associated with science achievement, understanding the nature of science, and attitude with the other canonical variate characterized by seven scales of an earlier version of the LEI, namely, friction, cohesiveness, control, disorganization, stratification, subservience, and formality.

The approach used in the present study was such that the LEI was administered in grade 7 classrooms and the respondents were asked to respond to it in relation to the total learning situation of the entire curriculum in their respective classrooms. Also, these students were administered achievement measures in vocabulary, reading, language arts, and mathematics and attitudinal and contextual items. Teachers completed a behavioural rating scale on behalf of each student and also provided their assessment of a number of aspects of the classroom. The purpose of the study was to assess the differential predictive power of the LEI for the achievement battery in relation to the student and teacher perceptions of the contextual aspects of the classrooms.

Method

Sample

Fourteen rural and 15 urban grade 7 classrooms participated in the study. A rural classroom was situated in a school in a community with a population of less than 10,000 and an urban classroom was located in a school in a community with a population of 10,000 or more. All of the selected classrooms were in communities in a mid-western province in Canada.

Instruments

Achievement tests. The selected classrooms were administered the Canadian Tests of Basic Skills (CTBS), Form 5 (King, 1982) in Vocabulary, Reading, Language, consisting of four subtests, Spelling, Capitalization, Punctuation, and Usage, and Mathematics, constituting three subtests, Concepts, Problem Solving, and Computation. These tests were administered by the classroom teachers in the same order and using the same testing sessions. The order of testing and the testing sessions were established by the researchers which followed the guidelines contained in the test manual. The administration of the CTBS was carried out between October 15 and November 15, 1985.

Learning environment. All the participating classrooms were given the Learning Environment Inventory (LEI) (Anderson, 1971) by the classroom teachers. The LEI consists of 105 items and includes 15 scales, namely, Cohesiveness, Diversity, Formality, Speed, Environment, Friction, Goal Direction, Favoritism, Difficulty, Apathy, Democratic, Cliqueness, Satisfaction,

Disorganization, and Competitiveness, with seven items on each. Extensive reliability and validity data on the LEI are available (see Fraser, 1986; Fraser, Anderson, & Walberg, 1982; Randhawa & Hunt, 1976).

The LEI was administered with the instruction that students, in responding to the items in this instrument, should judge the general conditions of learning in their language and mathematics lessons. Further, the answer sheet for recording an individual student's perception was numerically coded and an envelope was provided for sealing the completed answer sheet. Instructions to the subjects further assured them of the confidentiality of their responses and that their anonymity would be preserved under all circumstances.

Behavior rating. Teachers of the participating classrooms completed a Florida Key (Purkey, Cage, & Graves, 1973) for each student in their class. This instrument consists of 18 items comprising four scales, Relating, Asserting, Investing, and Coping. Basically, these scales provide teachers' assessments of students' behavioral manifestations in their classes.

Student questionnaire. Along with the LEI students also completed a demographic, situational, and attitudinal questionnaire. The situational part of the questionnaire elicited responses to questions pertaining to the amount of homework, types of books read, and the use of community library, etc. The attitudinal part of the questionnaire consisted of four

items which asked the student to indicate the extent to which the student and his/her classmates like teachers and school.

Teacher questionnaire. Teachers of the selected classrooms provided demographic information and the extent to which their class was cooperative, attentive, had the appropriate study skills, had been completing the assigned homework, and presented management problems.

Analysis and Results

Data for each class was aggregated by sex, and this aggregation produced 58 possible data points on each variable. Thus, the within-correlation matrix for a Locale x Sex design for the nine CTBS tests and subtests, as dependent variables, and the 15 LEI scales, as covariates, was used for a canonical correlation anlysis. One significant canonical correlation (r_c = .83, $p \leq .05$) was obtained. Structure coefficients for the canonical factors of both sets of variables and factor redundancies are given in Table 1. As can be seen in this table, all nine CTBS variables defined the canonical factor of this set, with the lowest correlation of .48 and the highest .92. The LEI variable set accounted for 33% of the variance in the CTBS set of variables, in terms of the factor redundancy. On the other hand, the CTBS variable set accounted for only 7% of the variance in the LEI set of variables. The bipolar LEI canonical factor was defined by Cohesiveness, Environment, Apathy, Democratic, and Disorganization scales. It appears, therefore, that these five LEI scales are critical in predicting achievement.

Insert Table 1 about here.

Similarly, a second canonical analysis was performed using the CTBS measures as the dependent variable set and 13 contextual variables, selected from the student questionnaire, teacher questionnaire, and the four FK scales, as the covariate set. These data sets produced one significant canonical correlation (r_c = .88, $p \leq .05$). Structure and redundancy coefficients for the canonical factors of the two sets of variables are provided in Table 2. Again, all the CTBS variables defined the canonical factor of the dependent variable set, with correlations of the variables with the canonical facor ranging from .37 to .79. Of the contextual variables, Peers like school, Like teacher, Relating, Asserting, and Coping had absolute correlations with their canonical factor greater than .30. Also, this factor was bipolar, the FK scales had negative correlations with the canonical factor. The contextual set of variables accounted for, in terms of the redundancy coefficient, 30% of the variance in the CTBS battery. On the other hand, the CTBS battery accounted for only 11% of the redundant variance in the set of contextual variables.

Insert Table 2 about here.

A third canonical correlation analysis was performed in which the nine CTBS tests were used as dependent variables and the nine LEI and contextual variables, on which in the previous two analyses the absolute loadings were greater than .30, were used as covariates. The purpose of this analysis was to assess whether the critical variables from the previous two sets would add substantially to the prediction of achievement variables, in terms of the total redundancy coefficient. Table 3 provides structure coefficients and factor redundancies for the two sets of variables. As can be seen here, only one significant canonical correlation was obtained. The CTBS tests loaded significantly on their canonical factor, $.58 \leq r \leq .81$. On the other hand, all the covariates except the Environment and Apathy scales had correlations with their canonical factor in the range $-.78 \leq r \leq .66$. The covariate set accounted for 39% of the redundant variance in the achievement battery and the achievement battery accounted for 18% of the redundant variance in the covariates. This critical covariate set of nine variables accounted for 6% and 9% more variance than the 15 LEI and 13 contextual variables, respectively.

Insert Table 3 about here.

A two-stage least squares linear structural relations (LISREL) analysis was performed using the data for the individual students (N = 511) in the 29 classes. Results of this analysis

are reported in Figure 1. It would appear that the latent variable FK1 (lamda = .49), defined by the FK scales, was critical in predicting the latent variable Achievement, which was characterized by the nine CTBS tests. Interestingly and as would be expected, TV viewing hours had a -.29 path weight which suggests that more an individual watches TV the lower that individual is expected to achieve on the CTBS tests. Similarly, Distance from school had a weight of -.13 and the latent variable LEI-2 had a weighting of -.21. It would seem that $R^2 = .37$ is substantial in predicting achievement by the four latent and three observed variables.

Insert Figure 1 about here.

A multivariate analysis of covariance (Mancova) was performed on the aggregated data using a Sex (M, F), x Locale (Urban, Rural) design with the CTBS battery as dependent variables and the LEI scales as covariates. The observed and adjusted means of the dependent variables on the two classifications are given in Table 4. Both Sex [F (9, 31) = 5.1, $p \leq .01$] and Locale [F (9, 31) = 3.9, $p \leq .01$] multivariate effects were significant. As shown in Table 3, univariate significant ($p \leq .10$) differences in favor of girls were obtained on Spelling, Capitalization, Punctuation, and Computation. On the Locale variable, univariate significant ($p \leq .10$) differences

in favor of the Urban group were obtained on Vocabulary, Capitalization, and Punctuation.

Insert Table 4 about here.

Discussion

The present research, using canonical correlation and LISREL analyses, demonstrates that cognitive and noncognitive variables are intricately interrelated (Messick, 1979). The fact that 33% of the variance in the achievement battery was found to be redundant with the LEI scales provides support to the conclusion of Fraser (1986) and Haertel et al. (1981). However, this predictive power can be augmented by contextual assessment of each pupil by the teacher, as has been demonstrated by the use of FK. Furthermore, a critical set of both LEI and contextual variables has been identified which markedly improved the accounted for redundant variance in the achievement battery. These critical noncognitive variables are: two LEI scales, Cohesiveness, Democratic; three FK scales, Relating, Asserting, and Coping; and two individual attitude items, Peers like school and I like teacher(s). These variables, as a set, require substantially less time for data collection and should make better sense if replicative evidence is available. We are hoping to provide that evidence with our ongoing research with a group of grade 10 classes.

As we were interested in ascertaining the influence of all the LEI and contextual variables on achievement variables, with the student as the unit of analysis, the LISREL analysis showed that the latent and observed predictor variables accounted for 37% of the variance in the latent achievement variable. The strongest influence of the FK1 is in sharp contrast to both the LEI latent variables. It suggests that the teacher assessment of the student classroom behavior has a significant predictive potential for achievement. However, the latent variable characterizing procedural aspects of the classroom environment (LEI-2), according to Randhawa and Hunt (1976), has a negative weight which suggests that students who perceive their class high in these procedural aspects score low on achievement. The other LEI latent variable, LEI-1, which captures emerging group interactions has a very low but positive loading on achievement. The second highest structural equation loading was that of the TV viewing hours, -.29. The direction of this weight is consistent with Keith, Reimers, Fehrman, Pottebaum, and Aubey's (1986) from a path analysis; however, their weight was only -.056. It is evident, therefore, that viewing too much TV mitigates achievement gains. Similarly, distance from school of a student's residence is critical for achievement.

The overall gender differences are consistent with Randhawa and Hunt (1987) and Clarke, Nyberg, and Worth (1980). However, Randhawa and Hunt reported female superiority in achievement on all the tests. This discrepancy may be due to the fact that the

present data set was only a subsample of the 1985 provincial sample, whereas the Randhawa and Hunt results were based on a systematic 1978 provincial sample. For the same reason, it may well be the case that our rural-urban differences are not consistent with the above two studies. However, the results of the present study are consistent with those theoretically expected and found in the U.S. and Europe in the 1970's. The changed demography and technological advances at the disposal of both rural and urban residents makes the segregation disadvantage hypothesis less tenable and a caution ought to be exercised in interpreting these differences.

References

Anderson, G. J. (1971). Assessment of learning environments: Manual for the Learning Environment Inventory and My Class Inventory (first edition). Halifax, Nova Scotia: Atlantic Institute of Education.

Anderson, G. J., & Walberg, H. J. (1968). Classroom climate and group learning. International Journal of Educational Sciences, 2, 175-180.

Bloom, B. S. (1976). Human characteristics and school learning. New York: Mcgraw-Hill.

Clarke, S. T. C., Nyberg, V., & Worth, W. H. (1980). Alberta grade 3 study, fall 1978. Edmonton: Department of Education. (ERIC Document Reproduction Service No. ED 179 552)

Cronbach, L. J., & Snow, R. E. (1977). Aptitudes and instructional methods: A handbook for research on interaction. New York: Irvington Publishers.

English, H. B., & English, A. C. (1958). A comprehensive dictionary of psychological and psychoanalytical terms. New York: Longmans Green.

Fraser, B. J. (1986). Classroom environment. London: Croom Helm.

Fraser, B. J., Anderson, G. J., & Walberg, H. J. (1982). Assessment of learning environments: Manual for Learning Environment Inventory (LEI) and My Class Inventory (MCI) (third version). Perth: Western Australian Institute of Technology.

Haertel, G. D., Walberg, H. G., & Haertel, E. H. (1981). Socio-psychological environments and learning: A quantitative synthesis. British Educational Research Journal, 7, 27-36.

Keith, T. Z., Reimers, T. M., Fehrman, P. G., Pottebaum, S. M., & Aubey, L. W. (1986). Parental involvement, homework, and TV time: Direct and indirect effects on high school achievement. Journal of Educational Psychology, 78, 373-380.

King, E. M. (1982). Canadian Tests of Basic Skills, Multilevel Edition, Levels 9-14, Forms 5 and 6, Teacher's Guide. Toronto, Ontario: Nelson Canada Ltd.

Messick, S. (1979). Potential uses of noncognitive measurement in education. Journal of Educational Psychology, 71, 281-292.

Purkey, W. W., Cage, B. N., & Graves, W. (1973). The Florida Key: A scale to infer learner self concept. Educational and Psychological Measurement, 33, 979-984.

Randhawa, B. S., & Hunt, D. (1976). Factors in classroom environment variables. Journal of Educational Psychology, 68, 546-549.

Randhawa, B. S., & Hunt, D. (1987). Sex and rural-urban differences in standardized achievement scores and mathematics subskills. Canadian Journal of Education, 12, 137-151.

Walberg, H. J. (1969). The social environment as mediator of classroom learning. Journal of Educational Psychology, 60, 443-448.

Table 1

Structure Coefficients for Canonical Factors of the CTBS Subtests and the Learning Environment Inventory Scales

Variable	Canonical Factor Structure
CTBS	
Vocabulary	66
Reading	61
Spelling	48
Capitalization	92
Punctuation	77
Usage	66
Mathematics Concepts	78
Mathematics Problem Solving	65
Mathematics Computation	68
Canonical Correlation	83
Factor Redundancy	33
LEI	
Cohesiveness	-68
Diversity	24
Formality	-07
Speed	12
Environment	36
Friction	-19
Goal Direction	09
Favoritism	16
Difficulty	-15
Apathy	40
Democratic	-41
Cliqueness	06
Satisfaction	17
Disorganization	56
Competitiveness	02
Canonical Correlation	83
Factor Redundancy	07

Note: All values are rounded off to two decimal places and the decimal is omitted.

Table 2

Structure Coefficients for Canonical Factors of the CTBS Subtests and Contextual Variables

Variable	Canonical Factor Structure
CTBS	
Vocabulary	62
Reading	43
Spelling	46
Capitalization	70
Punctuation	76
Usage	37
Mathematics Concepts	66
Mathematics Problem Solving	69
Mathematics Computation	79
Canonical Correlation	88
Factor Redundancy	30
Contextual	
Like School	27
Peers Like School	73
Like Teacher	58
Peers Like Teacher	11
Relating	-48
Asserting	-41
Investing	-28
Coping	-57
Classroom Cooperation	28
Classroom Attentiveness	01
Classroom Study Skills	27
Classroom Completion of Homework	03
Classroom Management	09
Canonical Correlation	88
Factor Redundancy	11

Note: All values are rounded off to two decimal places and the decimal is omitted.

Table 3

Structure Coefficients for Canonical Factors of the CTBS Subtests and the Learning Environment Inventory Scales

Variable	Canonical Factor
CTBS	
Vocabulary	70
Reading	58
Spelling	64
Capitalization	84
Punctuation	92
Usage	62
Mathematics Concepts	76
Mathematics Problem Solving	81
Mathematics Computation	69
Factor Redundancy	39
LEI & Contextual	
Cohesiveness	66
Environment	-28
Apathy	-14
Democratic	-55
Disorganization	28
Peers Like School	-78
Like Teacher	-53
Relating	52
Asserting	50
Coping	63
Factor Redundancy	18

Note: All values are rounded off to two decimal places and the decimal is omitted.

Table 4

Grade Seven Sample Observed and Adjusted[a] Means of the CTBS (Form 5) Tests for Sex and Locale Classifications

Variable	Sex		Locale	
	F(n=29)	M(n=29)	R(n=28)	U(n=30)
1. Vocabulary	26.14(25.77)	27.14(27.40)	25.01(24.53)*	28.16(28.64)
2. Reading	32.01(31.74)	30.62(30.86)	30.75(30.30)	31.84(32.30)
3. Spelling	29.62(29.61)*	25.78(25.80)	27.82(27.80)	27.59(27.61)
4. Capitalization	18.03(17.96)**	16.77(16.80)	16.75(16.67)**	18.01(18.09)
5. Punctuation	18.79(18.63)**	17.03(17.13)	16.92(16.92)**	18.83(18.83)
6. Usage	19.98(19.77)	18.27(18.42)	18.33(18.46)	19.86(19.74)
7. Mathematics Concepts	20.84(20.76)	21.26(21.31)	20.76(20.76)	21.31(21.32)
8. Mathematics Problem Solving	16.47(16.30)	15.51(15.63)	15.16(15.31)	16.77(16.62)
9. Mathematics Computation	23.24(23.24)*	20.62(20.62)	21.93(21.33)	21.93(22.53)

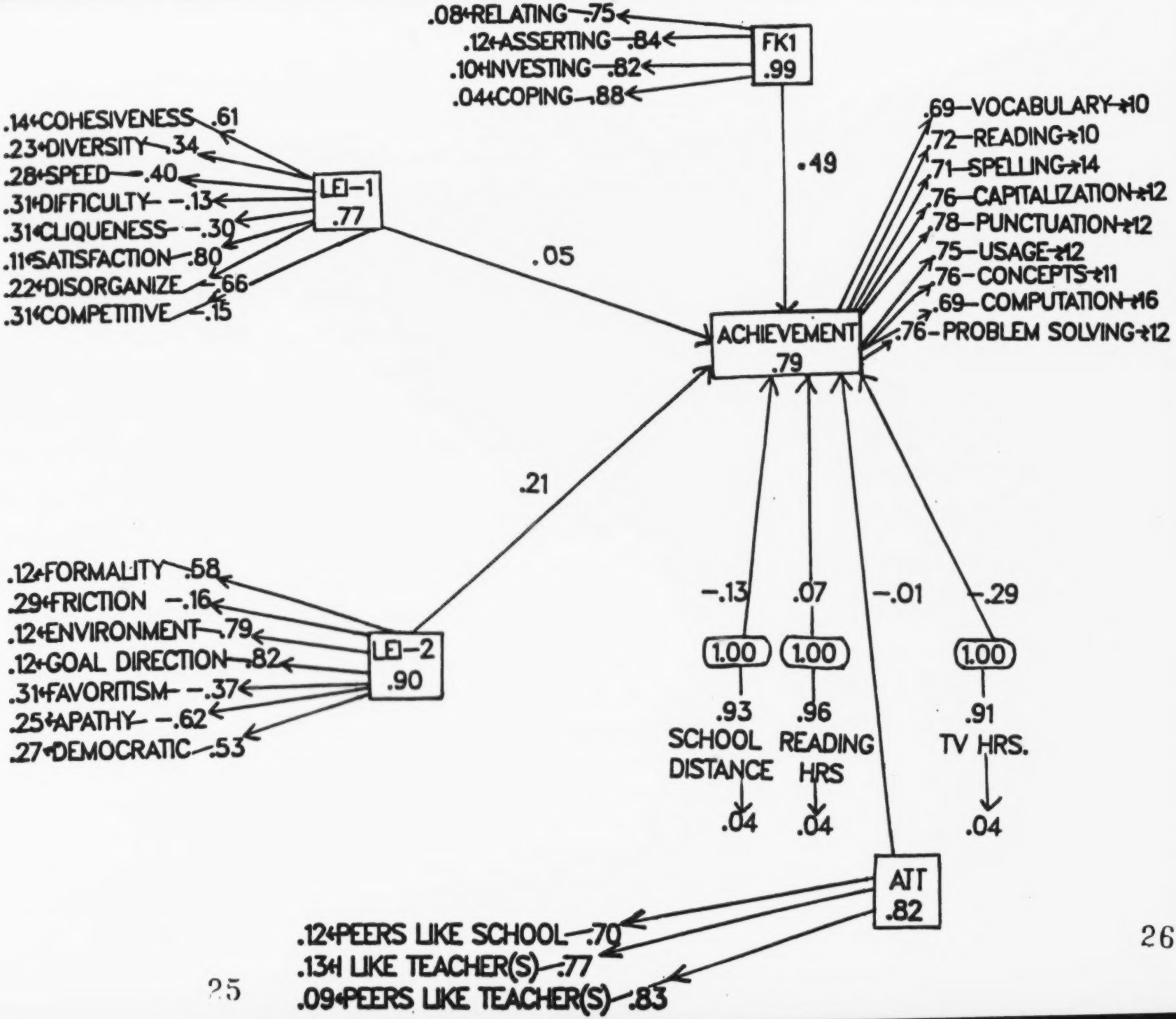
[a] Adjusted means are in parentheses

* $p < .10$

** $p < .05$

Figure Caption

Figure 1. Structural model from a two-stage least squares estimates.


.08 RELATING .75
.12 ASSERTING .84
.10 INVESTING .82
.04 COPING .88
FK1
.99
.49
.14 COHESIVENESS .61
.23 DIVERSITY .34
.28 SPEED .40
.31 DIFFICULTY -.13
.31 CLIQUENESS -.30
.11 SATISFACTION .80
.22 DISORGANIZE .66
.31 COMPETITIVE .15
LEI-1
.77
.05
.69 VOCABULARY .10
.72 READING .10
.71 SPELLING .14
.76 CAPITALIZATION .12
.78 PUNCTUATION .12
.75 USAGE .12
.76 CONCEPTS .11
.69 COMPUTATION .16
.76 PROBLEM SOLVING .12
ACHIEVEMENT
.79
.21
.12 FORMALITY .58
.29 FRICTION -.16
.12 ENVIRONMENT .79
.12 GOAL DIRECTION .82
.31 FAVORITISM -.37
.25 APATHY -.62
.27 DEMOCRATIC .53
LEI-2
.90
-.13
.07
-.01
-.29
1.00
1.00
1.00
.93
SCHOOL DISTANCE
.96
READING HRS
.91
TV HRS.
.04
.04
.04
ATT
.82
.12 PEERS LIKE SCHOOL .70
.13 I LIKE TEACHER(S) .77
.09 PEERS LIKE TEACHER(S) .83